light, the polarized disks *d'*, *d* would be reddish and the disks *c*, *c'* greenish, the central disk *c d* being of the tint formed by the union of the two shades. The analyzing prism K, and the selenite disk I, will detect free polarization in the disk *c d*, if it be coloured, as readily as if it were white; the only difference being that the two disks of light, *g*, *r*, cannot be brought to a uniform *white* colour when the lights from D and C are equal in intensity, but will assume a tint similar to that of *c d*. When the contrasts of colour between D and C are very strong—when, for instance, one is bright green and the other scarlet—there is some difficulty in estimating the exact point of neutrality; but this only diminishes the accuracy of the comparison, and does not render it impossible, as it would be according to other systems.

No attempt has been made in these experiments to ascertain the exact value of the standard spirit-flame in terms of the Parliamentary sperm-candle. Difficulty was experienced in getting two lots of candles yielding light of equal intensities; and when their flames were compared between themselves and with the spirit-flame, variations of as much as 10 per cent. were sometimes observed in the light they gave. Two standard spirit-flames, on the other hand, seldom showed a variation of 1 per cent., and had they been more carefully made they would not have varied 0·1 per cent.

This plan of photometry is capable of far more accuracy than the present instrument will give. It can scarcely be expected that the first instrument of the kind, made by an amateur workman, should possess equal sensitiveness with one in which all the parts have been skilfully made with special adaptation to the end in view.

ADDENDUM *to description of Photometer*. By W. CROOKES, F.R.S.

Received December 17, 1868.

When I wrote that other experimentalists had already made use of the phenomena of polarized light for measuring the intensity of light, I was not aware that a photometer already existed in which the principle of the one above described was adopted.

By the kindness of Sir Charles Wheatstone I have, within the last few days, been enabled to experiment with a photometer devised by M. Jamin, founded on the same principle. I have not yet succeeded in finding a printed account of this instrument, but a written one was supplied with it, and having been allowed to take it to pieces its construction is evident.

It consists, first, of a Nicol's prism, then of an achromatized doubly refracting prism; next, of two plates of quartz, cut oblique to the axis, reversed, and superposed; and finally, at the eye-end, of a second Nicol's prism. As in my instrument, each of the two lights to be compared split

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into two images; the ordinary ray from one is superposed on the extraordinary ray from the other, and the compound beam so produced is examined further. The means adopted to effect the desired object are, however, very different, being much simpler in my method, whilst the results are superior.

In Jamin's photometer the light which eventually reaches the eye is comparatively feeble, and the field of view is very restricted; the objects themselves under comparison are seen direct through the instrument without the interposition of a telescopic arrangement, and no means are taken to prevent extraneous light from entering. The deficiency of light makes observations by artificial light difficult, whilst when examining objects illuminated by diffused or direct sunlight the eye is fatigued and bewildered by the variations of shape, size, and colour assumed by the overlapping objects seen through the instrument. In the photometer described in the former part of this paper, there is abundance of light, and the observation is made upon two luminous disks, which are magnified by means of a lens, so as to appear close to the eye. It will be found much easier to detect differences of colour between these two adjacent disks than to observe the presence or absence of the coloured fringes in the central portion of the field of Jamin's photometer. In the former case the eye has nothing to observe but two uniform and purely coloured disks, changing from red-green to green-red through an intermediate stage of neutrality; in the latter case the eye has to detect the stage of neutrality in the central portion of the field, where the two images under comparison overlap, the attention being distracted, and the sensitiveness of the eye weakened, by the brilliantly coloured fringes which cross the adjacent objects.

A direct comparison of the two instruments for sensitiveness shows that the present photometer will detect much more minute differences of intensity than Jamin's will, whilst it will work with tolerable accuracy in a light too feeble to give any results with the latter instrument.

April 8, 1869.

Lieut.-General SABINE, President, in the Chair.

The following communications were read:—

I. "Preliminary Notice on the Mineral Constituents of the Breitenbach Meteorite." By Professor N. STORY MASKELYNE, M.A. Communicated by Professor WARINGTON W. SMYTH, F.R.S. Received March 2, 1869.

This meteorite, which belongs to the rare class intermediate between meteoric irons or siderites and meteoric stones or aërolites (a class to